SERVICE MANUAL

Layer Picker

Carriage Mount & Fork Mount Models

Manual Number 6849001

cascade® corporation

CONTENTS

1.1 Introduction

This manual provides the Periodic Maintenance, Troubleshooting, Service and Specifications for the Cascade Carriage Mount and Fork Mount Layer Pickers.

In any communication about the attachment, refer to the product catalog and serial numbers stamped on the nameplate as shown. If the nameplate is missing, the numbers can be found stamped on one of the following locations:

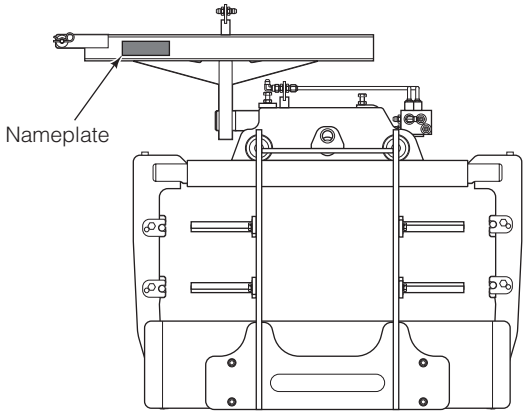
Fork Mount Model – The right side of the mounting frame.

Carriage Mount Model – The upper center back of the mounting frame.

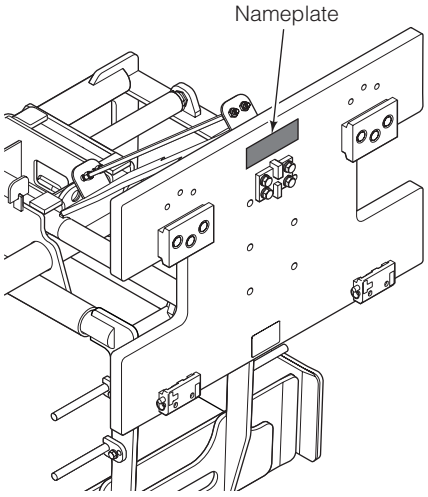
IMPORTANT: All hoses, tubes and fittings on layer picker are JIC.

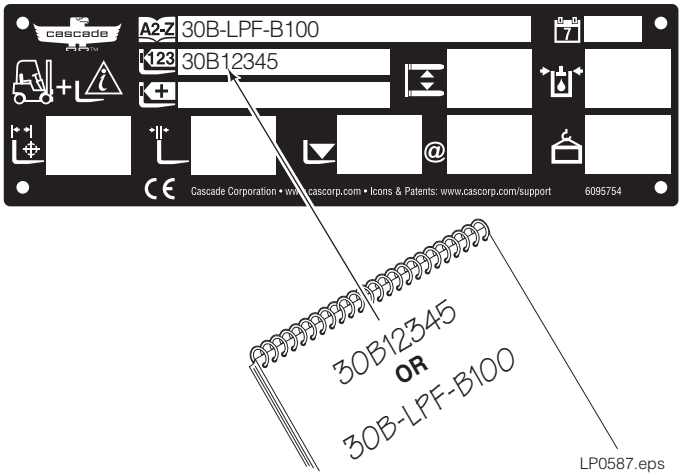
NOTE: Specifications are shown in both US and (Metric) units. All fasteners have a torque value range of ±10% of stated value.

Fork Mount Model



Carriage Mount Model





1.2 Special Definitions

The statements shown appear throughout this manual where special emphasis is required. Read all WARNINGS and CAUTIONS before proceeding with any work. Statements labeled IMPORTANT and NOTE are provided as additional information of special significance or to make your job easier.

WARNING - A statement preceded by WARNING is information that should be acted upon to prevent **bodily injury.** A **WARNING** is always inside a ruled box.

CAUTION - A statement preceded by CAUTION is information that should be acted upon to prevent machine damage.

IMPORTANT - A statement preceded by IMPORTANT is information that possesses special significance.

NOTE - A statement preceded by NOTE is information that is handy to know and may make your job easier.

NOTE: If equipped with sideshifter assembly option, for periodic maintenance schedule, refer to Sideshifter Installation Manual (Cascade Part No. 672358) or Sideshifter Service Manual (Cascade Part No. 677487).

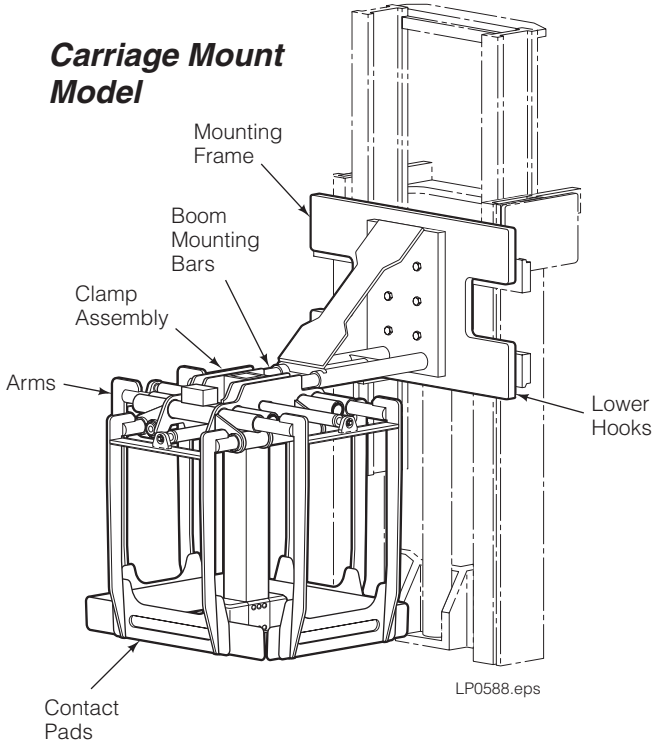
2.1 100-Hour Maintenance

Every time the lift truck is serviced or every 100 hours of truck operation, whichever comes first, complete the following maintenance on the layer picker:

- Check for loose or missing bolts, damaged or worn hoses and hydraulic leaks.
- Inspect contact pads, arms, and forks for damage or wear. Replace as necessary.
- Inspect clamp anchor nuts for proper connection and tightness. If necessary tighten to 160 ft.-lbs. (220 Nm).
- Check that the clamp assembly is level during normal operation. Adjust as necessary.
- **Fork Mount –** Check that the pin retainer's lock is engaged.

WARNING: After completing any service procedure, always test each function through five complete cycles. First test with no load, then test with a load to make sure the attachment operates correctly before returning it to the job.

Carriage Mount Model



2.2 500-Hour Maintenance

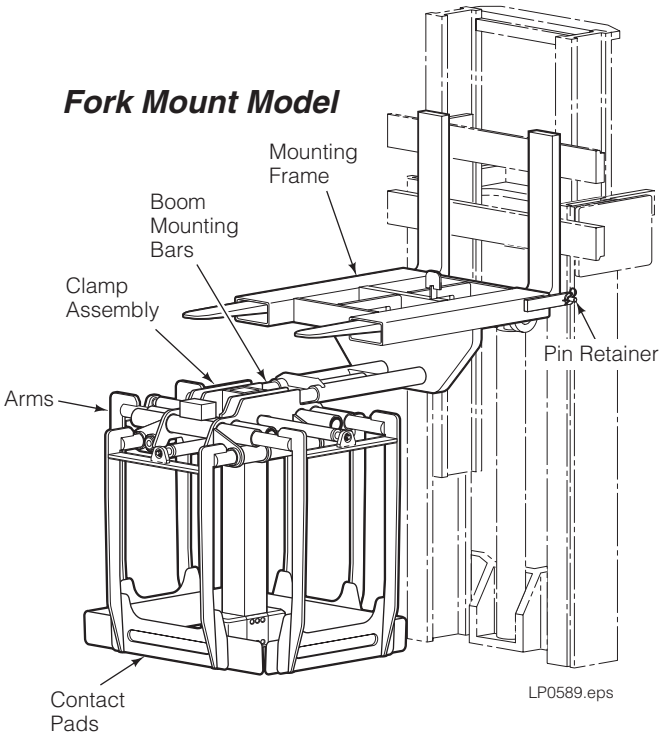
After each 500 hours of truck operation, in addition to the 100-hour maintenance, perform the following procedures.

- Check the clearance between the lower mounting hooks and the truck carriage bar:

  Quick-Change Hooks – 3/16 in. (4.8 mm) maximum
  Bolt-On Hooks – 3/32 in. (2.4 mm) minimum and 3/16 in. (4.8 mm) maximum.

  If adjustment is necessary, refer to Section 4.1-1. Tighten the lower hook capscrews to 125 ft.-lbs. (170 Nm).

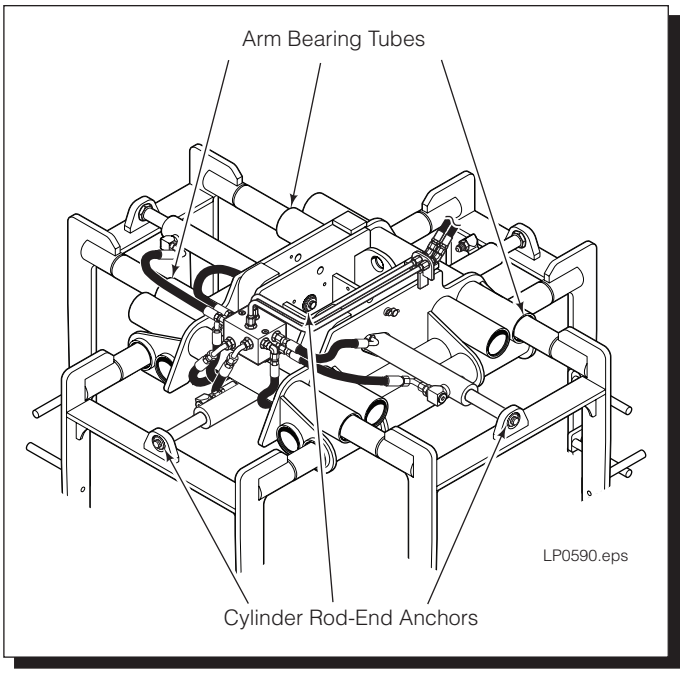
Fork Mount Model



2.3 1000-Hour Maintenance

After each 1000 hours of truck operation, in addition to the 100 and 500-hour maintenance, perform the following procedures:

- Inspect clamp arms, arm bearings, boom mounting bars and center spacer bearings (if equipped) for wear. Replace as necessary.



2.4 2000-Hour Maintenance

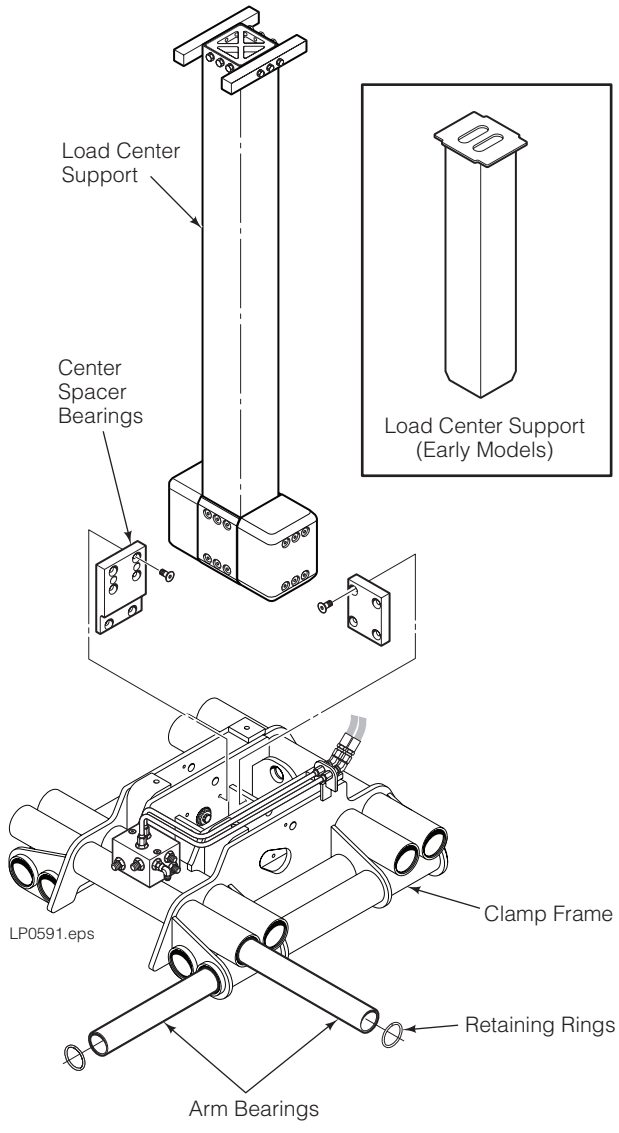
After each 2000 hours of truck operation, in addition to the 100, 500 and 1000-hour maintenance, perform the following procedures:

- If equipped with load center support, replace center load spacer bearings.
- Replace clamp arm bearings. Refer to Sections 4.2-5.
- **Fork Inspection –** After 2000 hours of truck operation, forks in use shall be inspected at intervals of not more than 12 months (for single shift operations) or whenever any defect or permanent deformation is detected. Severe applications will require more frequent inspection.

  Fork inspection shall be carried out by trained personnel to detect any damage that might impair safe use. Any fork that is defective shall be removed from service. Reference ANSI B56.1-2005. Inspect for the following defects:

  – Surface cracks
  – Straightness of blade and shank
  – Fork angle
  – Difference in height of fork tips
  – Positioning lock
  – Wear on fork blade and shank
  – Wear on fork hooks
  – Legibility of marking

  NOTE: Fork Safety Kit 3014162 contains wear calipers, inspection sheets and safety poster. Also available is fork hook & carriage wear gauge 209560 (Class II) and 209561 (Class III).



3.1 General Procedures

3.1-1 Truck System Requirements

- Truck hydraulic pressure should be within the range shown in Specifications, Section 5.1. **PRESSURE TO THE ATTACHMENT MUST NOT EXCEED 2300 psi (160 bar).**
- Truck hydraulic flow should be within the range shown in Specifications, Section 5.1.
- Hydraulic fluid supplied to the layer picker must meet the requirements shown in Specifications, Section 5.1.

WARNING: Before servicing any hydraulic components, relieve pressure in the attachment system. Turn the truck off and move the truck auxiliary control valve levers several times in both directions.

After completing any service procedure, always test the attachment through several cycles. First test empty to bleed any air trapped in the system to the truck tank. Then test with a load to be sure the unit operates correctly before returning it to the job.

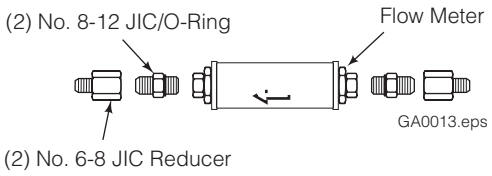
Stay clear of the load while testing. Do not raise the load more than 4 in. (10 cm) off the floor while testing.

3.1-2 Tools Required

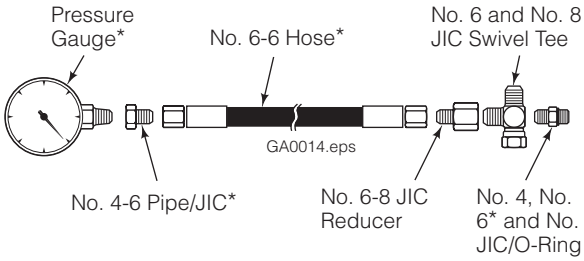
In addition to a normal selection of mechanic's hand tools, the following are required:

- Inline Flow Meter Kit:
  10 GPM (37 L/min) - Cascade Part No. 671476.
  20 GPM (75 L/min.) - Cascade Part No. 671477.
- Pressure Gauge Kit:
  5000 psi (345 bar) - Cascade Part No. 671212.
- Assortment of fittings and hose.
- Pallet hand truck to install clamp assembly on the mounting assembly.
- Overhead hoisting capability that is at least the rated capacity of the attachment weight. Refer to attachment nameplate.
- Metric hex key allen set to adjust pressure reliefs.

Flow Meter Kits: 671476 (10 GPM - 37 L/min)
671477 (20 GPM - 75 L/min)



Pressure Gauge Kit: 671212



3.1-3 Troubleshooting Chart

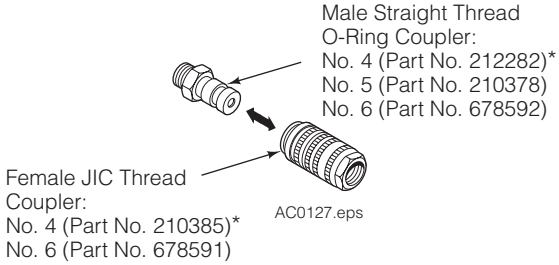
Determine All The Facts – It is important to gather all the facts about the problem before beginning any service procedures. The first step is to talk to the equipment operator. Ask for a complete description of the malfunction. Guidelines below and on the following pages can then be used as a starting point to begin troubleshooting.

Clamp Circuit

- Load slips after it has been picked up.
- Clamp assembly will not carry load up to its rated capacity.
- Clamp assembly arms move slowly or not at all.

  To correct these problems, refer to Sections 3.1-4 and 3.3.

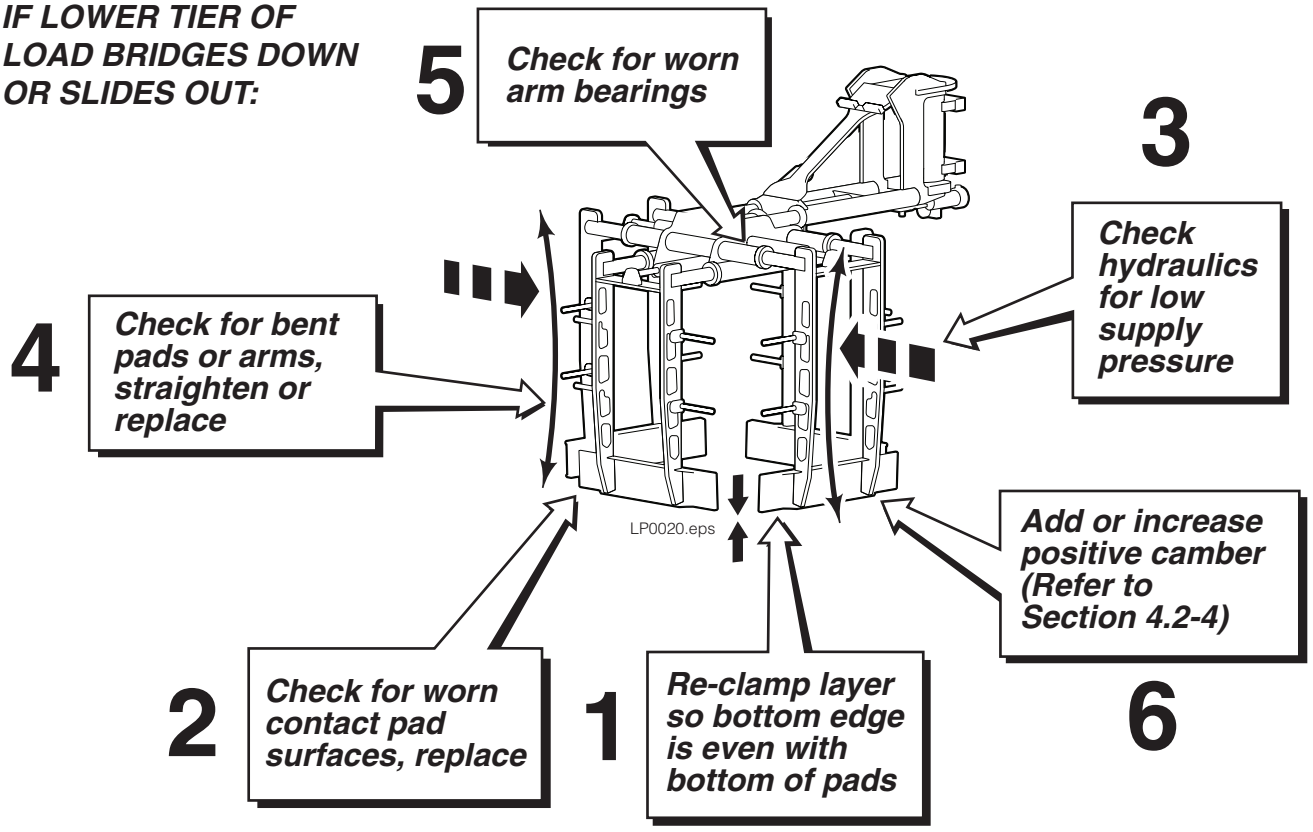
Quick-Disconnects



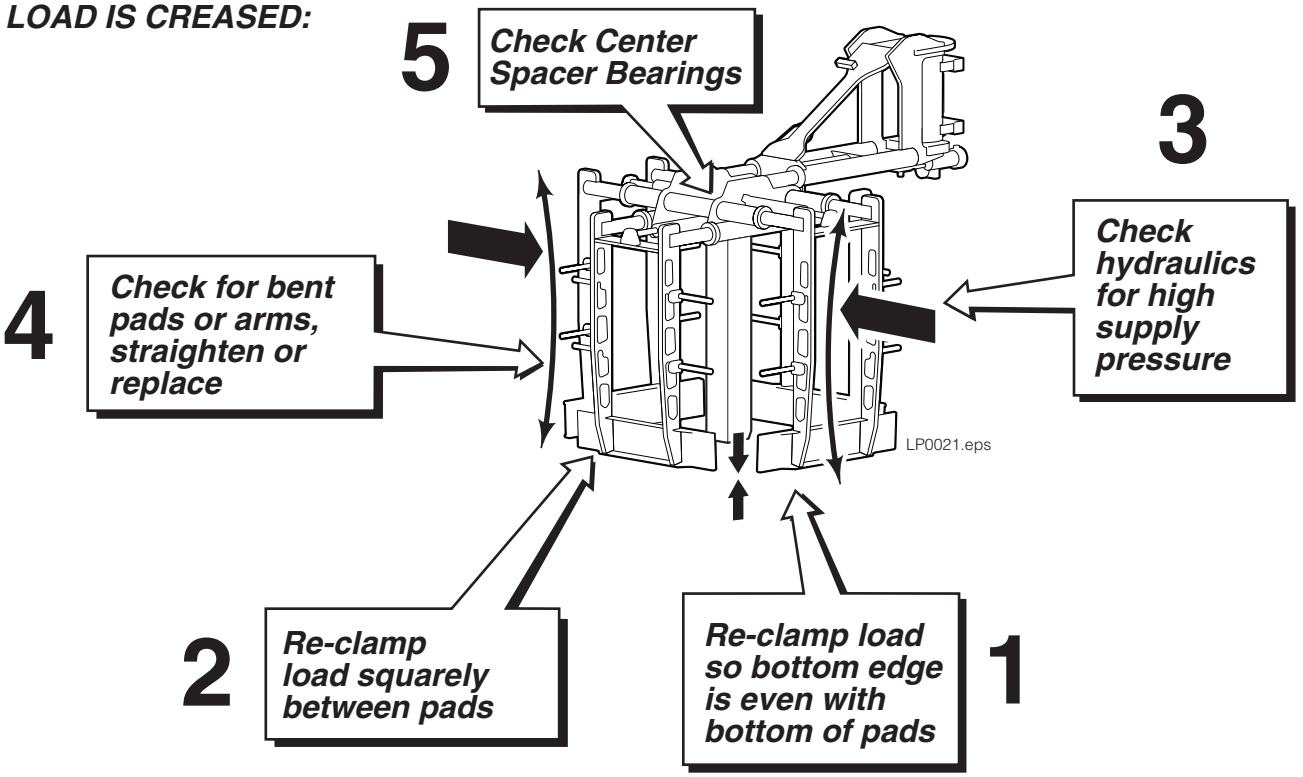
*** NOTE: Diagnostics Kit 394382 includes items marked.**

3.1-4 Layer Picker Loads

IF LOWER TIER OF LOAD BRIDGES DOWN OR SLIDES OUT:



IF LOWER TIER OF LOAD IS CREASED:

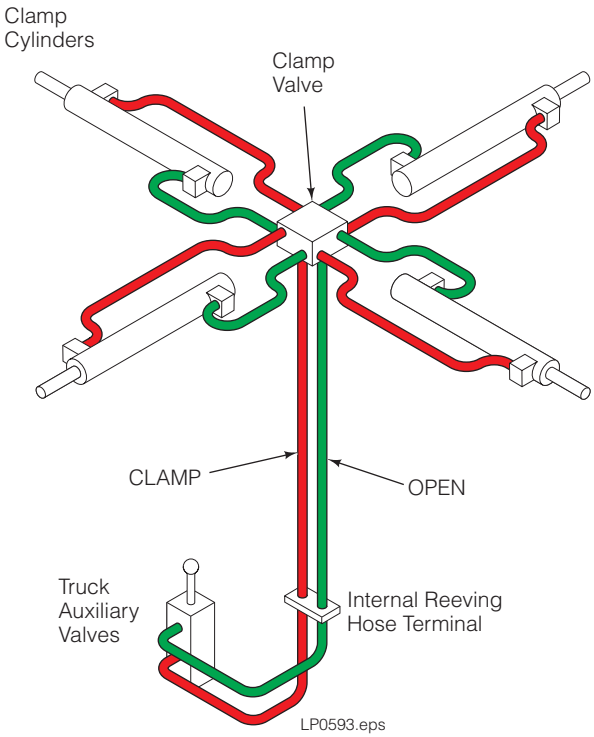


3.2 Plumbing

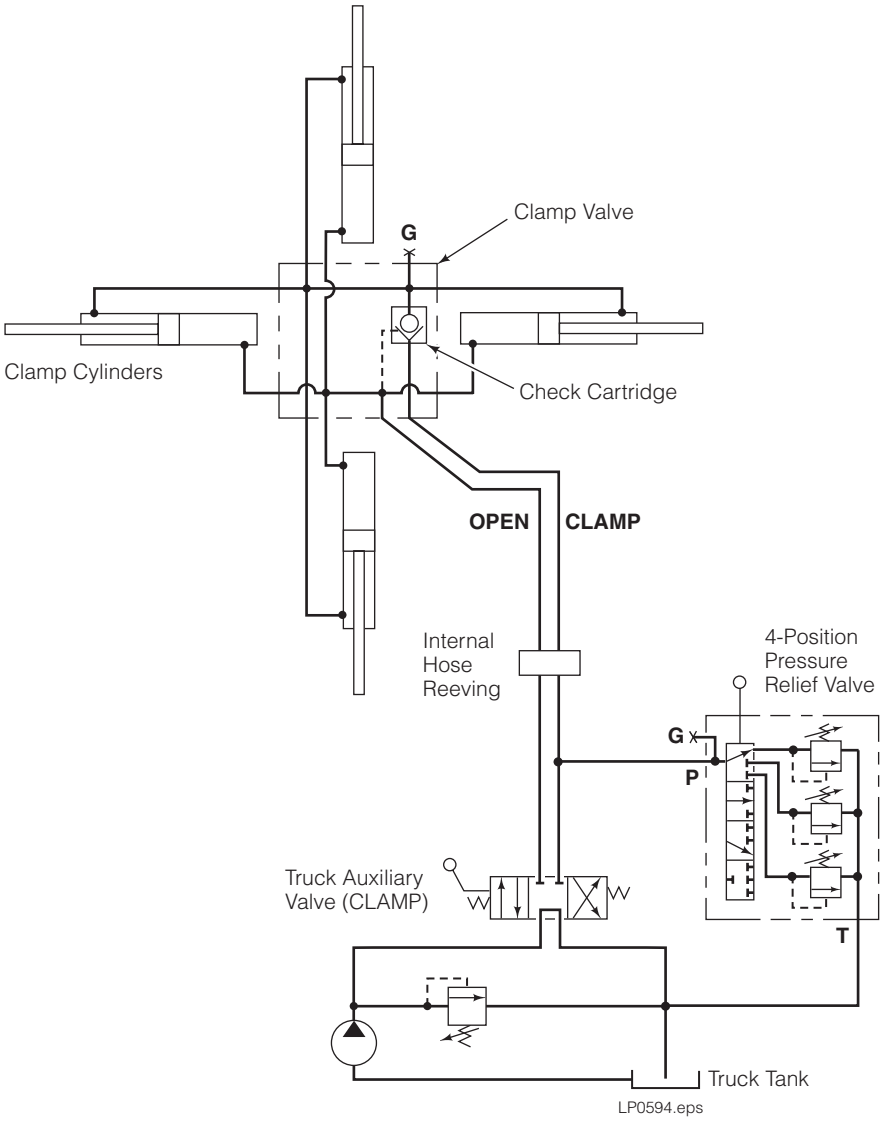
3.2-1 Hosing Diagrams – Clamp Circuit

OPEN ARMS
PRESSURE
RETURN

NOTE: For **CLAMP ARMS**, reverse the colors shown.



3.2-2 Hydraulic Schematic



3.3 Clamp Function

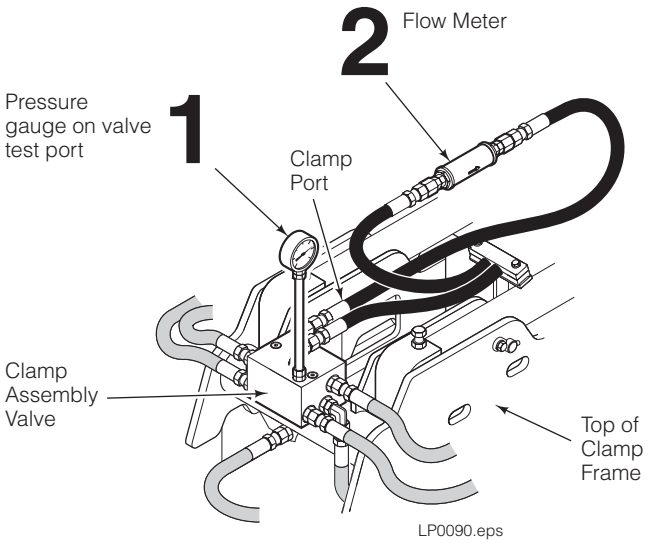
There are five potential problems that could affect the CLAMP functions:

- Incorrect load handling. Refer to *Operator's Guide* for suggested procedures.
- Incorrect hydraulic pressure or flow from the lift truck.
- External leaks.
- Worn/defective cartridge valves or cylinder seals.
- Damaged or worn clamp arms or bearings

WARNING: Before removing hydraulic lines or components, relieve pressure in the attachment hydraulic system. Turn the truck off and move the auxiliary control lever several times in both directions.

3.3-1 Supply Circuit Test

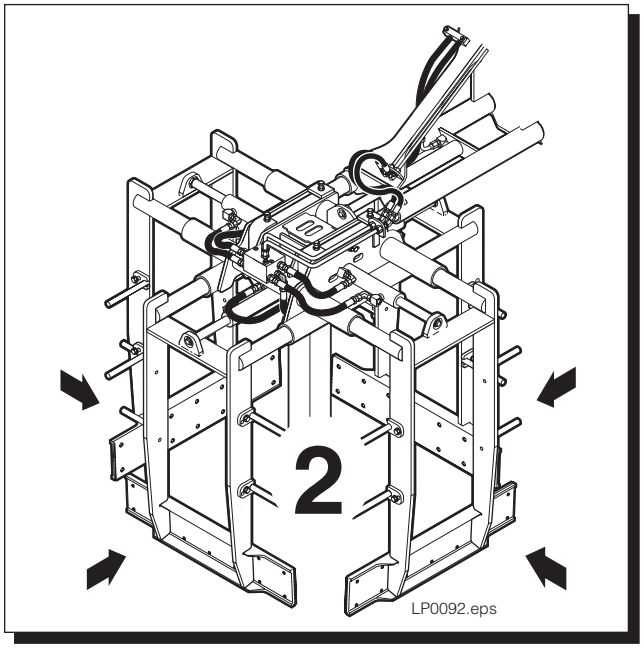
1. Check the pressure supplied by the truck at the clamp assembly valve. Pressure must be within the range shown in Specifications, Section 5.1. **PRESSURE TO THE ATTACHMENT MUST NOT EXCEED 2300 PSI (160 bar).**
2. Check the flow volume at the clamp assembly valve. Flow must be within the range shown in Specifications, Section 5.1.
3. Clamp on a load, holding the lever in the CLAMP position for a few seconds. Release the lever and check for external leaks at fittings, hoses, valve, revolving connection and cylinder rods.



Front View

3.3-2 Clamp Circuit Test

1. Position the arms to midstroke. Turn the truck off and relieve system pressure by moving the CLAMP lever back and forth several times. Connect a 3000 psi (200 bar) pressure gauge to the test port on top of the clamp assembly valve.
2. Start the truck and clamp on a load, holding the lever in the CLAMP position for a few seconds.
3. Release the lever and watch the pressure gauge:
   - If the pressure drop **is less** than 150 psi (10 bar) initially, and additional drop does not exceed 25 psi (1.7 bar) per minute, the problem is not hydraulic. Refer to Section 3.3 (above).
   - If the pressure drop **is more** than 150 psi (10 bar) initially, and additional drop exceeds 25 psi (1.7 bar) per minute, the clamp assembly check valve may be faulty. Replace the cartridge. If the pressure still drops as above, one or more of the cylinders requires service.



3.3-2 Clamp Circuit Test (Continued)

4 To test a single cylinder, isolate the other three by disconnecting the hoses to the cylinder rod ends. Refer to the illustration shown below.

CAUTION: Plug the hose ends and cap the cylinder fittings before starting the truck.

5 Start the truck and clamp on a load, holding the lever in the CLAMP position for a few seconds.

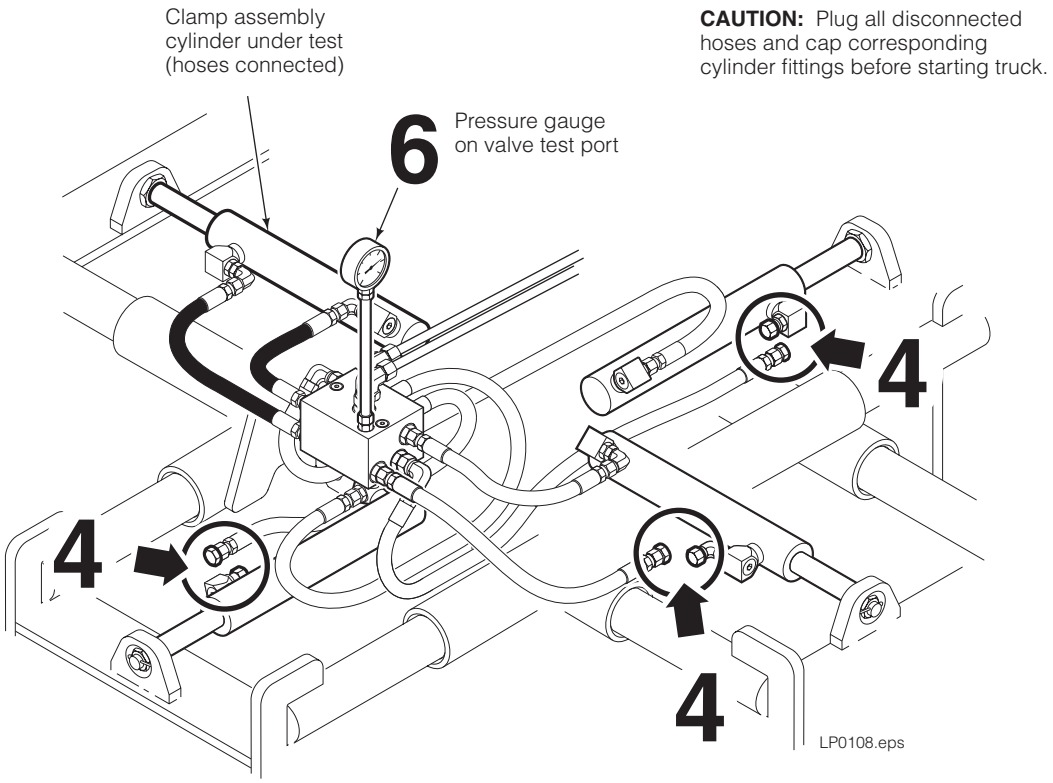
6 Release the lever and watch the pressure gauge:

- If the pressure drop **is more** than 150 psi (10 bar) initially, and additional drop exceeds 25 psi (1.7 bar) per minute, the cylinder under test is faulty and requires service. Refer to Section 4.3.
- If the pressure drop **is less** than 150 psi (10 bar) initially, and additional drop does not exceed 25 psi (1.7 bar) per minute, one or more of the other cylinders is faulty and requires service.

  Check the pressure of the other cylinders, as described above, to isolate the faulty cylinder. Install new seals in all cylinders (refer to Section 4.3).

WARNING: Before removing hydraulic lines or components, relieve pressure in the attachment hydraulic system. Turn the truck off and move the auxiliary control lever several times in both directions.

ISOLATING A SINGLE CYLINDER



Front View

4.1 Layer Picker Removal

4.1-1 Carriage Mount

> **WARNING**: Before removing any hoses, relieve pressure in the hydraulic system. With the truck off, open the truck auxiliary control valve(s) several times in both directions.

1 Disconnect the truck supply hoses. Plug the hoses and cap the fittings.

2 Disconnect the lower mounting hooks.

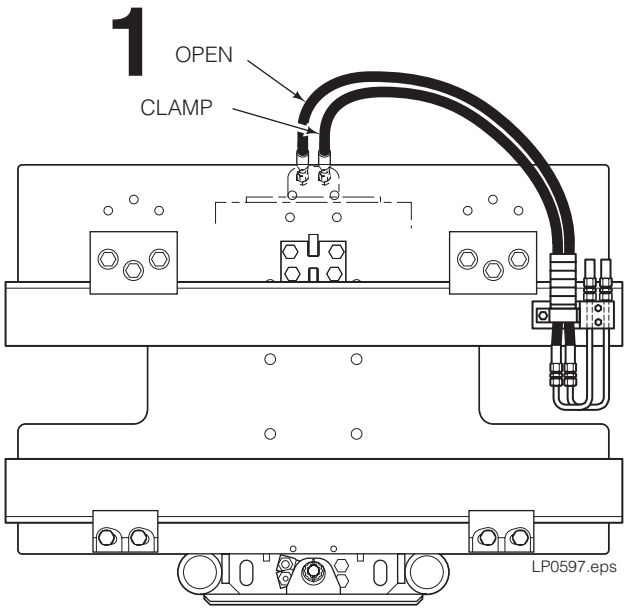
Bolt-On Type – Remove the lower mounting hooks. For reassembly, tighten the capscrews to a toque of 165 ft.-lbs. (225 Nm).

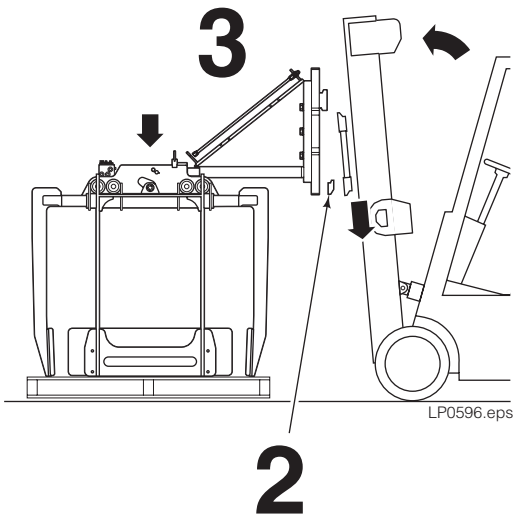
Quick-Change Type – Pull out the retaining pin, slide the hook down and reinstall the pin in the lower hole. For reassembly, slide the hooks up to the locked position and install the locking pins in the top holes.

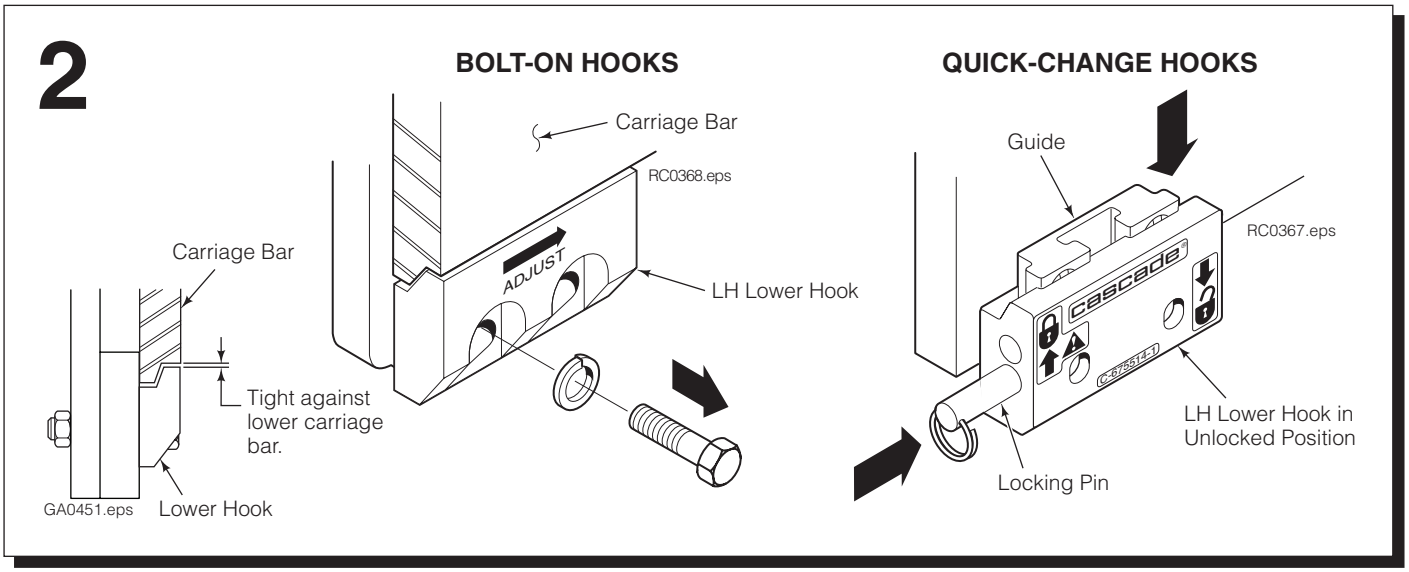
3 Lower the attachment onto a pallet. Tilt the mast forward and lower the carriage to remove the attachment from the truck.

4 For attachment installation, reverse the above procedures with the following exceptions:

- For complete installation procedure, refer to Installation Instructions 222964.





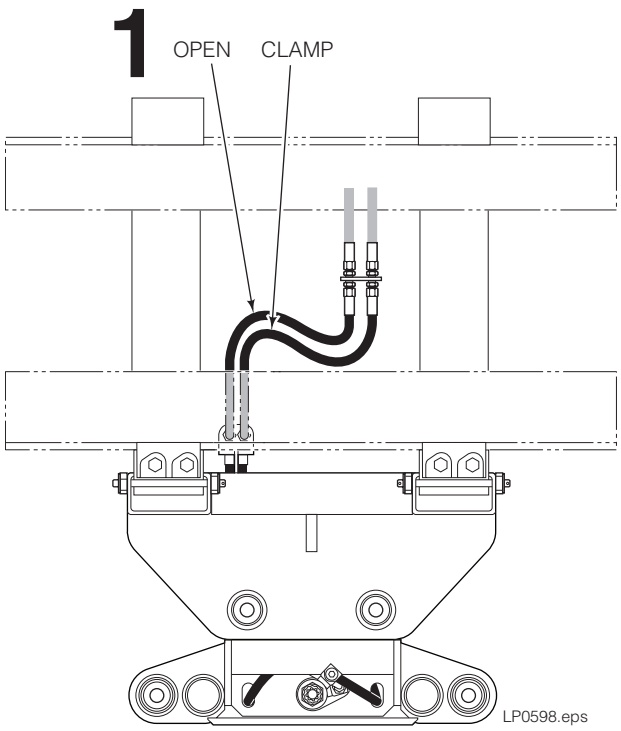


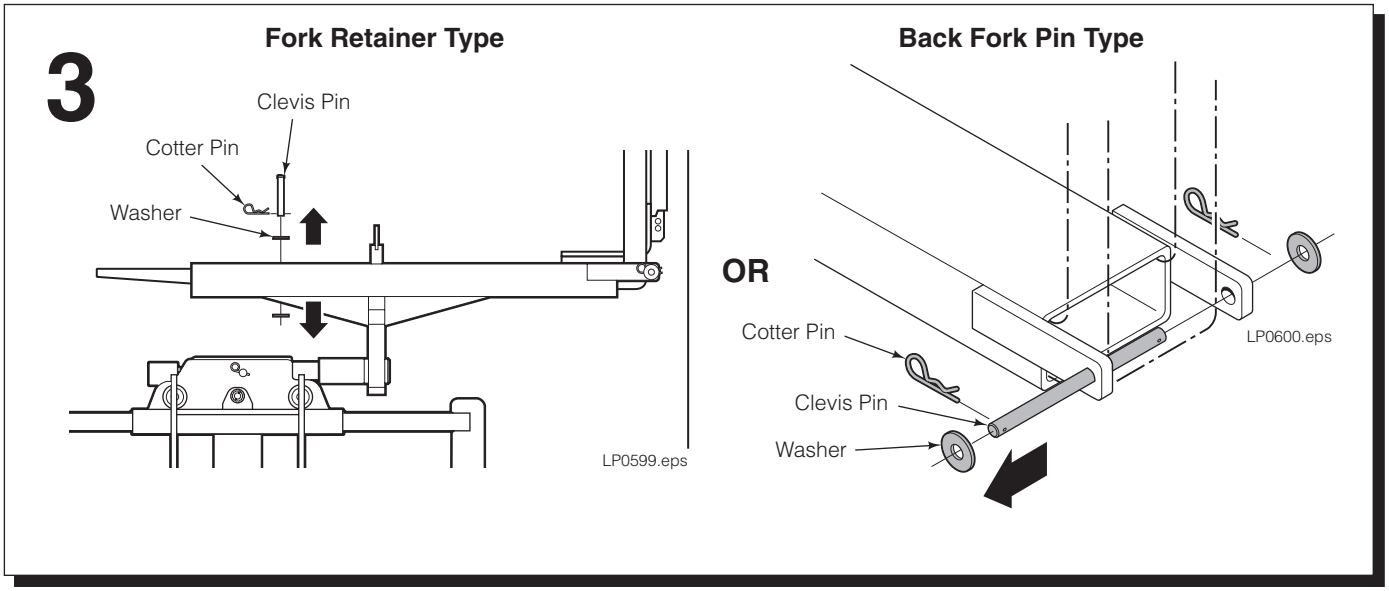
4.1-2 Fork Mount

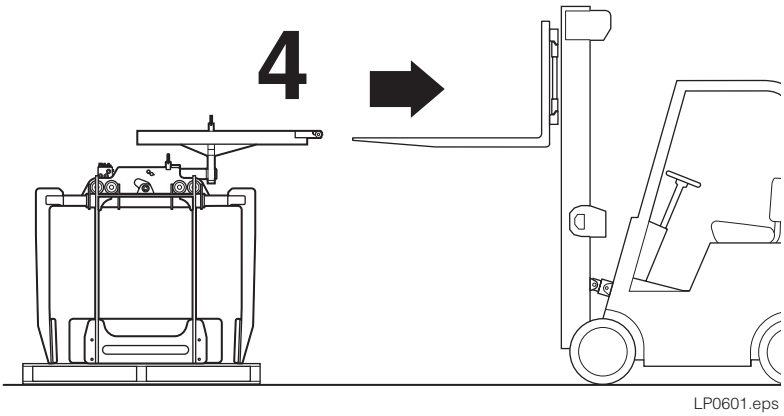
WARNING: Before removing any hoses, relieve pressure in the hydraulic system. With the truck off, open the truck auxiliary control valve(s) several times in both directions.

1. Disconnect the truck supply hoses. Plug the hoses and cap the fittings.
2. Lower the attachment onto a pallet.
3. **Fork Retainer Type –** Remove the cotter pin, located underneath the fork mount, from the clevis pin. Keep track of washers.

   Back Fork Pin Type – Remove the cotter pin from each side of the clevis pin. Keep track of the washers.
4. Back truck out of the fork mount slots.
5. For attachment installation, reverse the above procedures with the following exceptions:
   - For complete installation procedure, refer to Installation Instructions 222964.







4.2 Clamp Assembly

4.2-1 Removal

1 Lower the clamp assembly onto a pallet.

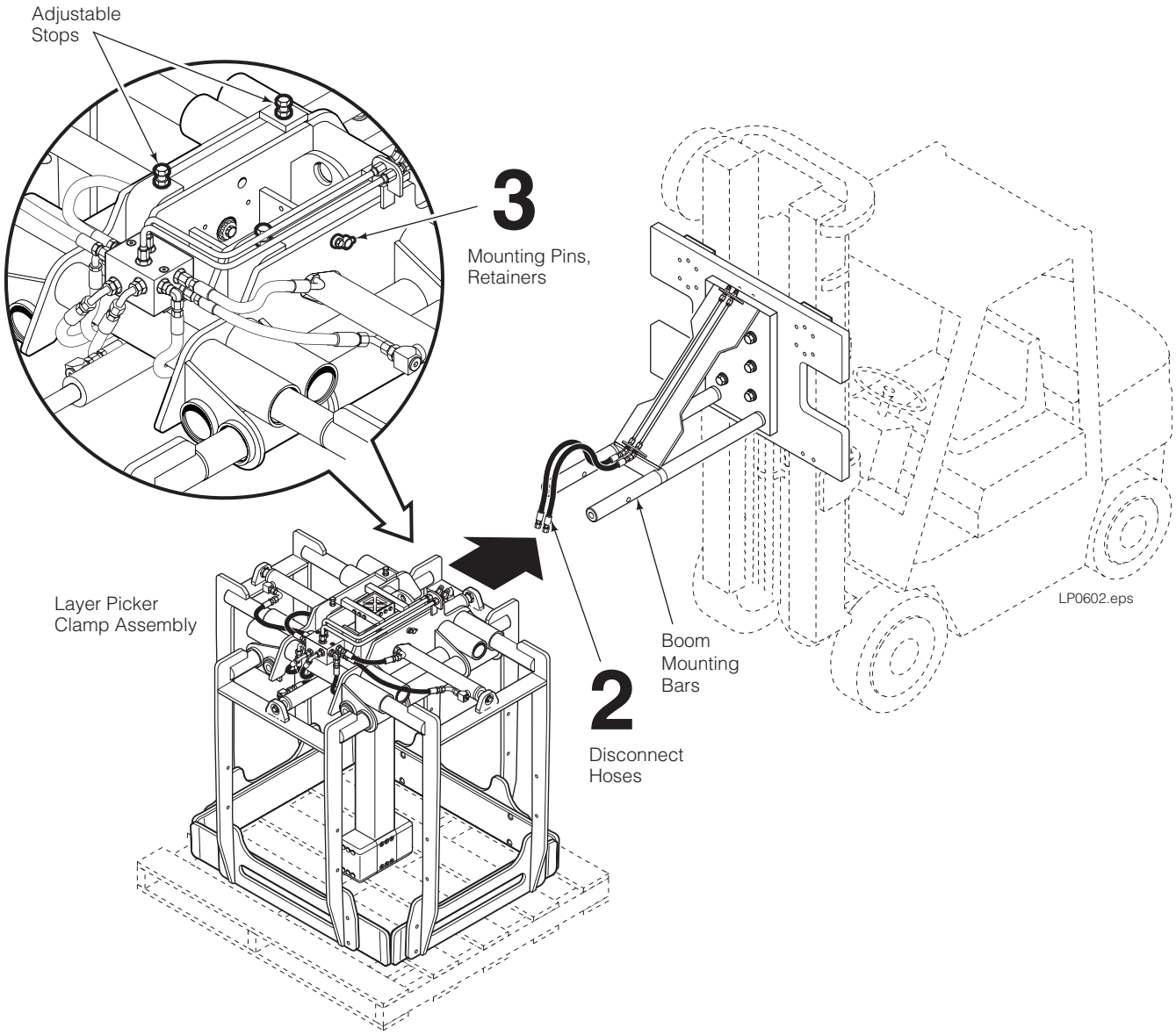
> **WARNING**: Before removing any hoses, relieve pressure in the hydraulic system. With the truck off, open the truck auxiliary control valve(s) several times in both directions.

2 Disconnect the hoses from the bulkhead fittings. Tag hoses for reassembly. Plug the hoses and cap the valve fittings.

3 The clamp assembly can be disengaged by removing the two mounting pin retainers and mounting pins connecting the carriage/fork boom mounting bars to the clamp assembly. For reassembly, tighten the pin retainer capscrews to 20 ft.-lbs. (30 Nm).

4 For reassembly, reverse the above procedures with the following exceptions:

- Inspect the boom mounting bars for damage or wear.
- Inspect the mounting pins for wear and replace if necessary.



4.2-2 Arms – Removal and Installation

The following procedure can be performed without removing the clamp assembly.

1 Lower the clamp assembly onto a pallet until it just touches the surface.

2 Disconnect the cylinder rod end from the arm to be removed. For reassembly, assemble the parts as shown. Tighten the spherical nut against the hex washer to 160 ft.-lbs. (220 Nm).

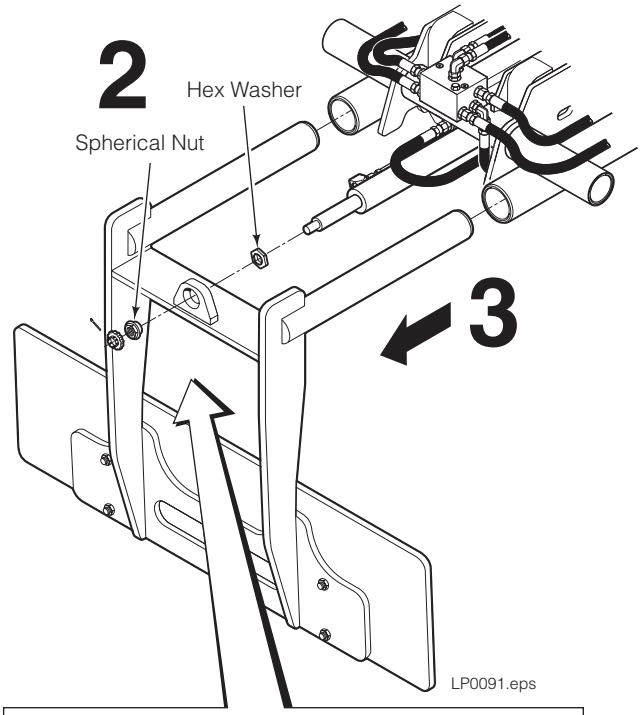
NOTE: Rod end joint operates with a loose operating clearance. Secure locking cap with a new cotter pin.

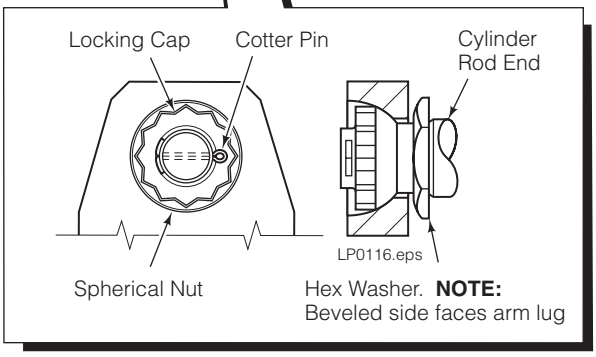
WARNING: Keep hands and feet out from under contact pads and arms.

3 Slide the arm out of the clamp frame. Do not damage the bearings when removing the arm.

4 For reassembly, reverse the above procedures with the following exceptions:

- Inspect the arm bearings for wear and replace if necessary. Refer to Section 4.2-5.
- Apply chassis grease to the cylinder rod end joint.





4.2-3 Contact Pad – Rotation or Replacement

NOTE: Contact pad surfaces that are worn or damaged over the entire pad area will require pad replacement. If only the lower surface is worn, some pads can be rotated 180° and reinstalled.

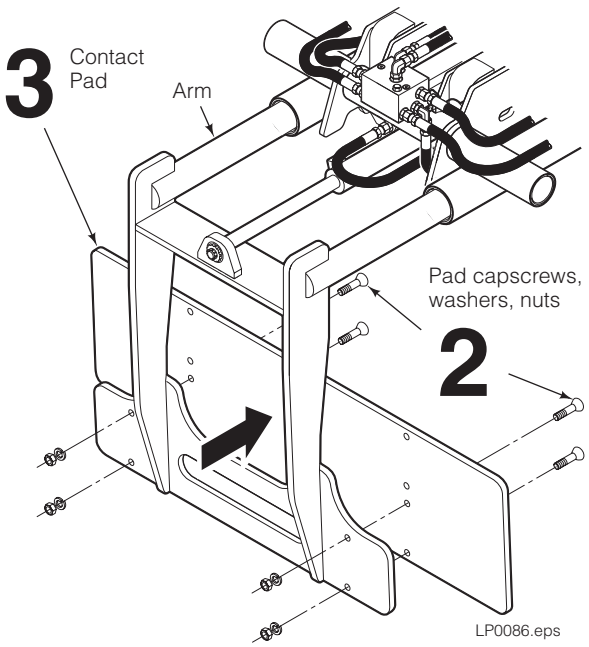
1 Extend the arms fully.

2 Remove the capscrews and nuts fastening the contact pad to the arm base. For reassembly, tighten the capscrews to 65 ft.-lbs. (90 Nm).

NOTE: Reinstall shims in original position to maintain same pad camber setting. Refer to Section 4.2-4 to determine pad camber.

3 Remove the contact pad. Rotate the pad 180° (some pad layouts) or install a new pad.

4 For reassembly, reverse the above procedures.



4.2-4 Contact Pad Camber Adjustment

The following procedures can be performed with the attachment mounted on the truck.

1 Extend the arms to midstroke. Make sure that the clamp is not resting directly on the floor or pallet.

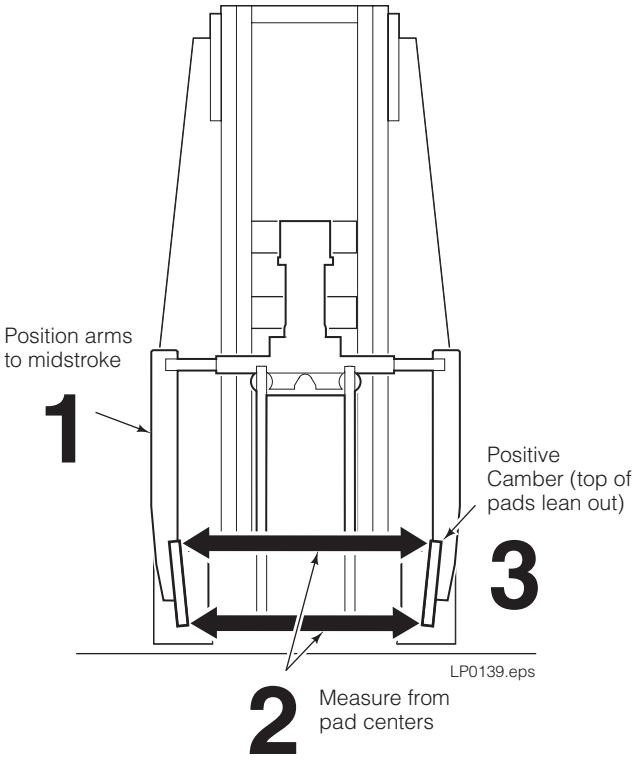
2 Measure the distance between the pads at the top and bottom. The difference between the two measurements is the pad camber.

3 Determine the camber adjustment required. Refer to recommended starting points in table below.

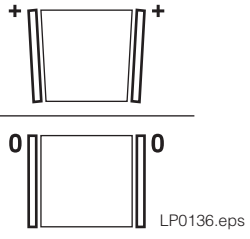
4 Loosen the capscrews and nuts fastening the contact pad to the arm base. For reassembly, tighten the capscrews to 65 ft.-lbs. (90 Nm).

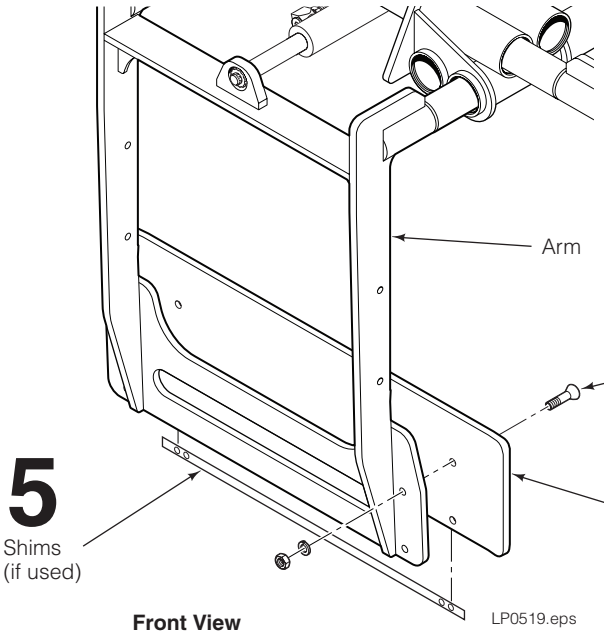
5 Install shims included in shim kit 6155363, as required. Installing shims at the bottom of the pad provides *positive* camber (top of pad leans out).

CAUTION: Use an equal number of shims on each contact pad. Pad camber must be the same on all pads for proper load handling.

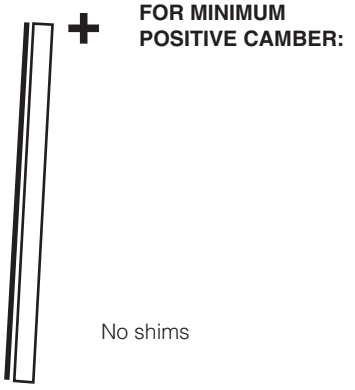


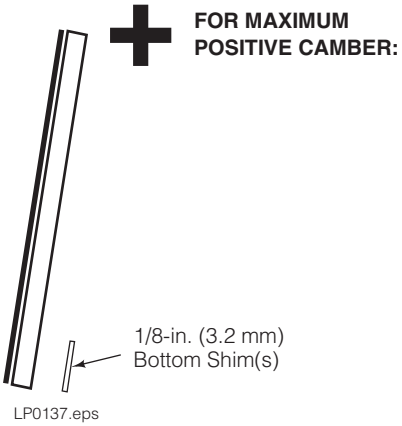
Load	Opposite Pads - Lower Tier
CANNED / BOTTLED / DENSE CASE GOODS	Neutral-to-Positive
BOXED LIGHT CASE GOODS	Neutral





Front View





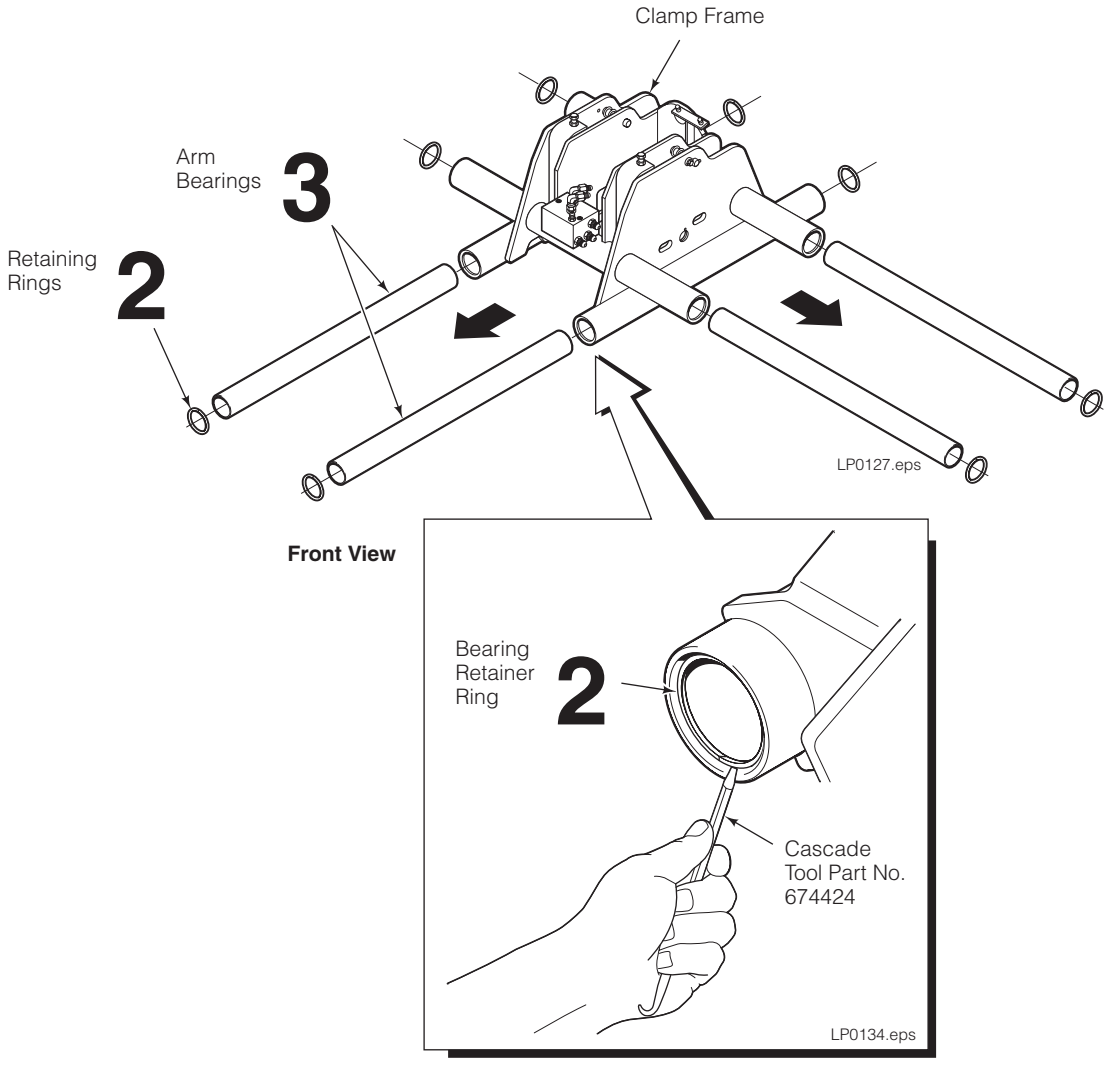
IMPORTANT: Shim all four pads equally.

4.2-5 Arm Bearing Replacement

NOTE: Replace all arm bearings if wear is found in one arm bearing.

1. Remove the four clamp arms as described in Section 4.2-2.
2. Remove the internal Teflon retaining rings from the clamp frame tubes.

   NOTE: Use Cascade brass tool 674424 (or a thin blade screwdriver) to remove the rings. Avoid damaging the grooves in the frame.
3. Pull the bearings out of the frame.
4. For reassembly, reverse the above procedures with the following exception:
   - Use new bearing retaining rings when installing the new bearings.

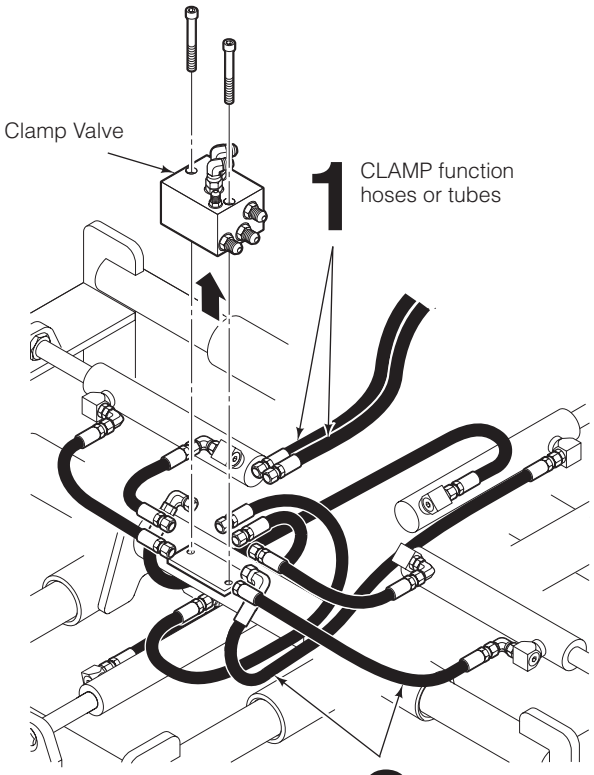


4.2-6 Clamp Valve Removal, Installation

WARNING: Before removing hydraulic lines, relieve pressure in the attachment hydraulic system. Turn the truck off and move the auxiliary control valve several times in both directions.

1. Disconnect the two CLAMP function hoses or tubes from the top of the valve. Plug the hose or tube ends and tag for reassembly.
2. Disconnect the eight cylinder supply hoses from the valve. Plug the hose ends and tag for reassembly.
3. Remove the capscrews fastening the valve to the top of the boom. For reassembly, tighten the capscrews to 65 ft.-lbs. (90 Nm).
4. Service the valve as described in Section 4.2-7.
5. For reassembly, reverse the above procedures.

   IMPORTANT: Verify that hoses are connected as shown. Refer to hydraulic schematic, Section 3.2-2.

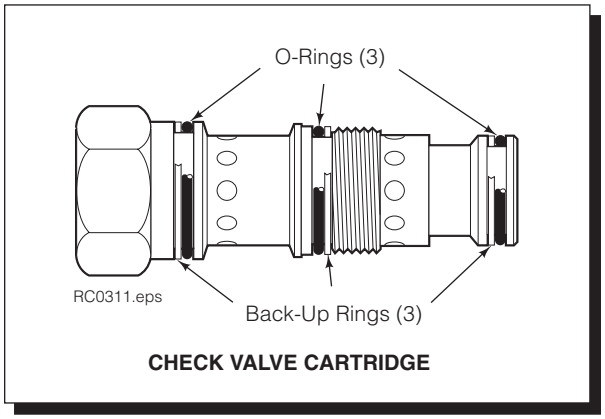


Front View

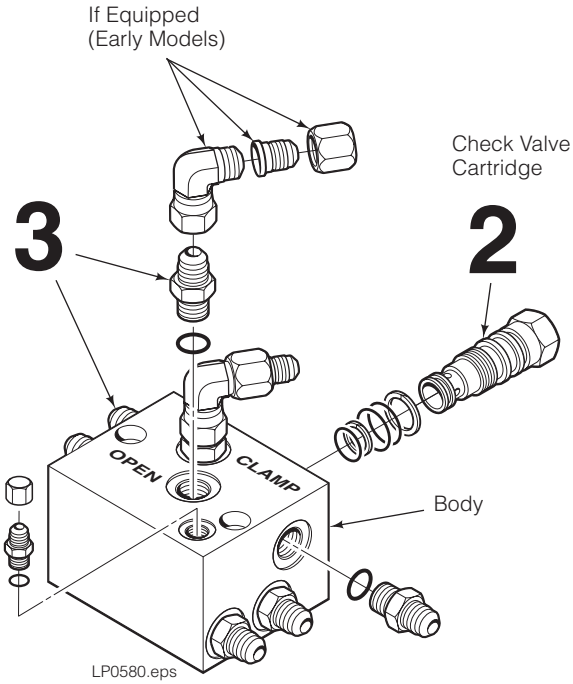
4.2-7 Valve Service

IMPORTANT: Service the valve in a clean work area.

1. Remove the valve from the clamp assembly as described in Section 4.2-6.
2. Remove the check valve cartridge from the valve and remove the O-rings and back-up rings.
3. Remove the fittings from the valve.
4. Clean all parts with solvent.
5. For reassembly, reverse the above procedures with the following exceptions:
   - Replace O-rings and back-up rings on check valve cartridge as shown.



CHECK VALVE CARTRIDGE



4.3 Clamp Cylinders

4.3-1 Cylinder Removal and Installation

NOTE: The following procedure can be performed with the attachment mounted on the truck and the clamp arms remaining on the attachment.

1 Close the arms fully.

> **WARNING:** Before removing hydraulic lines, relieve pressure in the attachment hydraulic system. Turn the truck off and move the auxiliary control valves several times in both directions.

2 Disconnect the hydraulic hoses from the cylinder to be removed. Plug the hoses and cap the cylinder ports. Tag hoses for reassembly.

3 Disconnect the cylinder ends from the arm lug and frame by removing the cotter pin, locking cap, spherical nut and hex washer.

4 Slowly slide the clamp arms outward 3 in. (75 mm) to remove the cylinder.

CAUTION: Use care not to disengage the clamp arms from the clamp frame, or the boom arms from the boom when removing the cylinders.

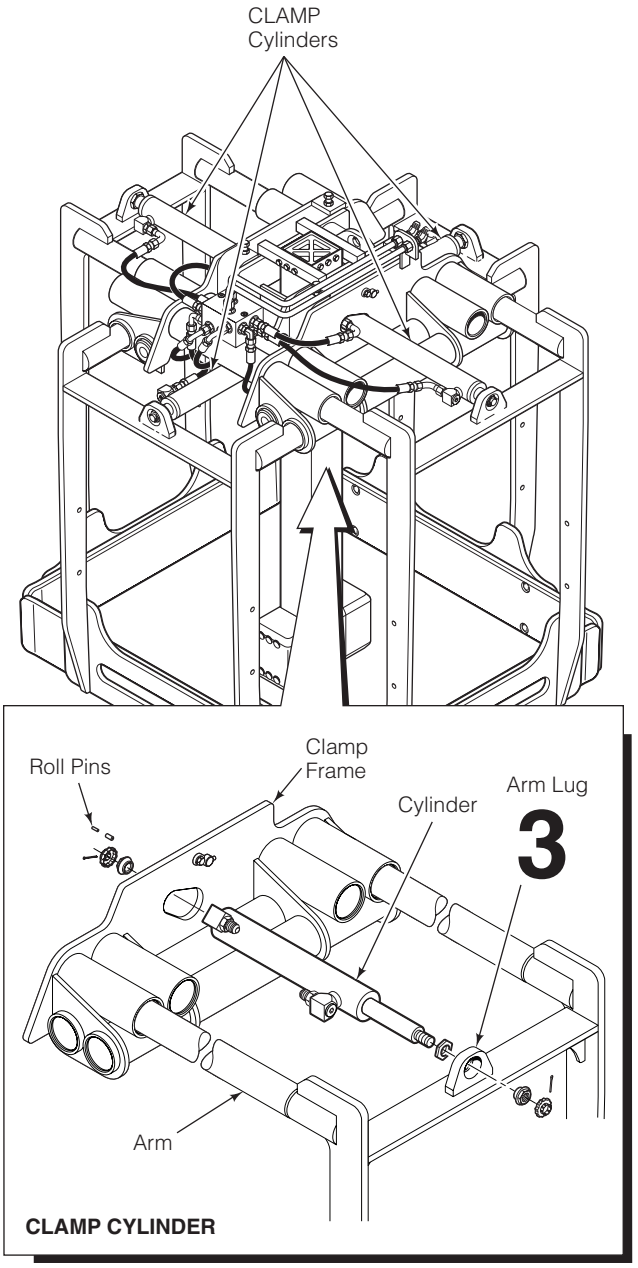
5 Service the cylinder as described in Section 4.3-2.

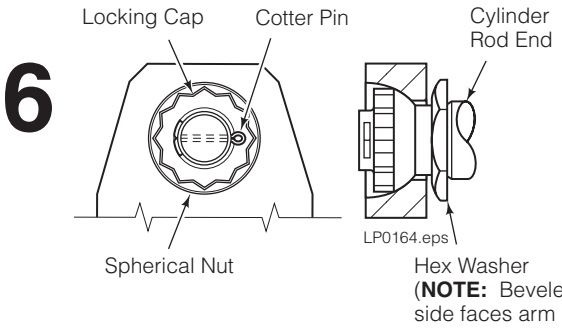
6 For reassembly, reverse the above procedures with the following exceptions for the cylinder anchors:

- Lubricate threads with chassis grease and assemble cylinder anchors as shown.
- Install hex beveled washer on cylinder rod end.

  NOTE: Verify that the beveled side of washer faces mount (see illustration).
- Tighten spherical nuts against rod hex washer and cylinder head end to 160 ft.-lbs. (220 Nm).

  NOTE: Joints function with a loose operating clearance. Lubricate with chassis grease.
- Install locking cap and secure with new cotter pin.





4.3-2 Cylinder Disassembly

1 Clamp the cylinder in a soft-jawed vise at the extreme head end only. Do not clamp in middle of shell.

2 Unscrew and remove the retainer using a claw-type spanner wrench as shown. (Cascade Part No. 678598).

3 Remove the rod/piston assembly from the cylinder.

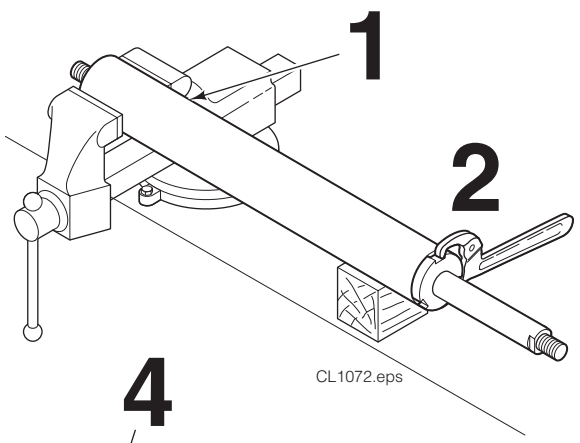
4 To remove the piston, clamp the rod assembly in a vise on the wrench flats as shown.

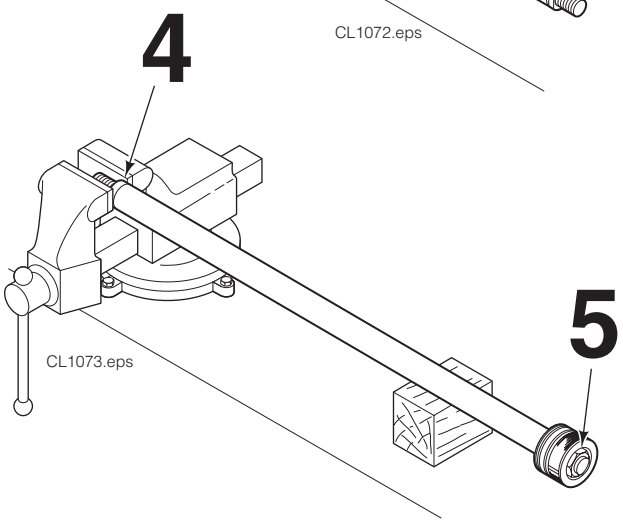
CAUTION: Do not clamp on the cylinder rod sealing surface.

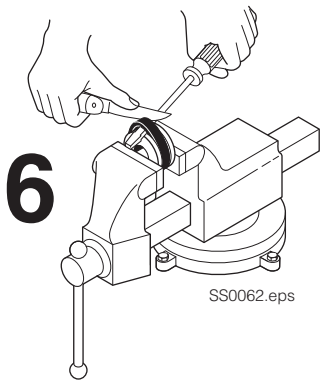
5 Remove the piston nut and remove the piston from the cylinder rod.

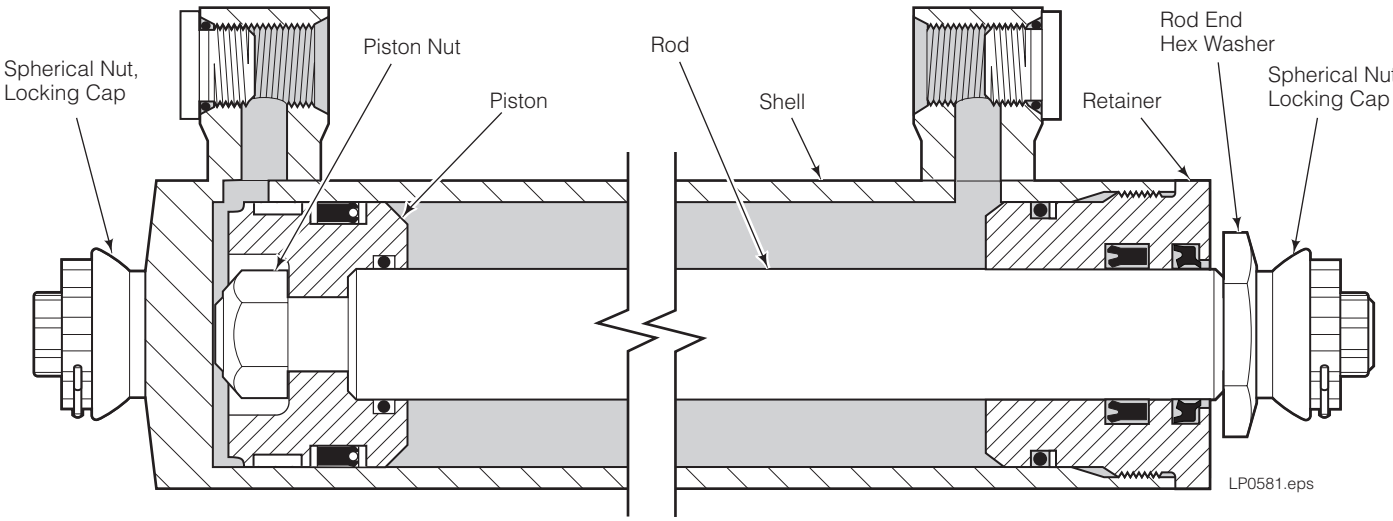
6 Place the piston or retainer in a soft-jawed vise to remove the seals. Pry the seals or O-rings up with a brass seal removal tool (Cascade Part No. 674424) and cut the seals to remove them.

CAUTION: Do not scratch seal grooves.









4.3-3 Cylinder Inspection

- Inspect the rod, piston and retainer for nicks or burrs. Minor nicks or burrs may be removed with 400-grit emery cloth. If they cannot be removed, replace the parts.
- Inspect the cylinder bore and remove any minor nicks or burrs with a butterfly. If they cannot be removed, replace the part.
- Inspect the outside of the shell for any deformities or cuts that could impair performance or cause leaks under pressure. If necessary, replace the part.
- Inspect the spherical nuts and hex washer for wear and replace as necessary.

4.3-4 Cylinder Reassembly

1 Lubricate all new seals and O-rings with petroleum jelly.

2 Note the direction of the U-cup seals. Pressure seals must be installed with the lip toward the high pressure side of the cylinder.

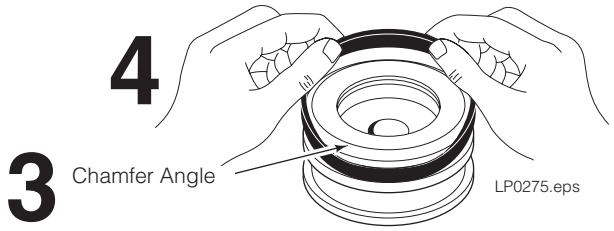
3 Polish the piston and retainer chamfer angles with 400-grit emery cloth to ease seal installation.

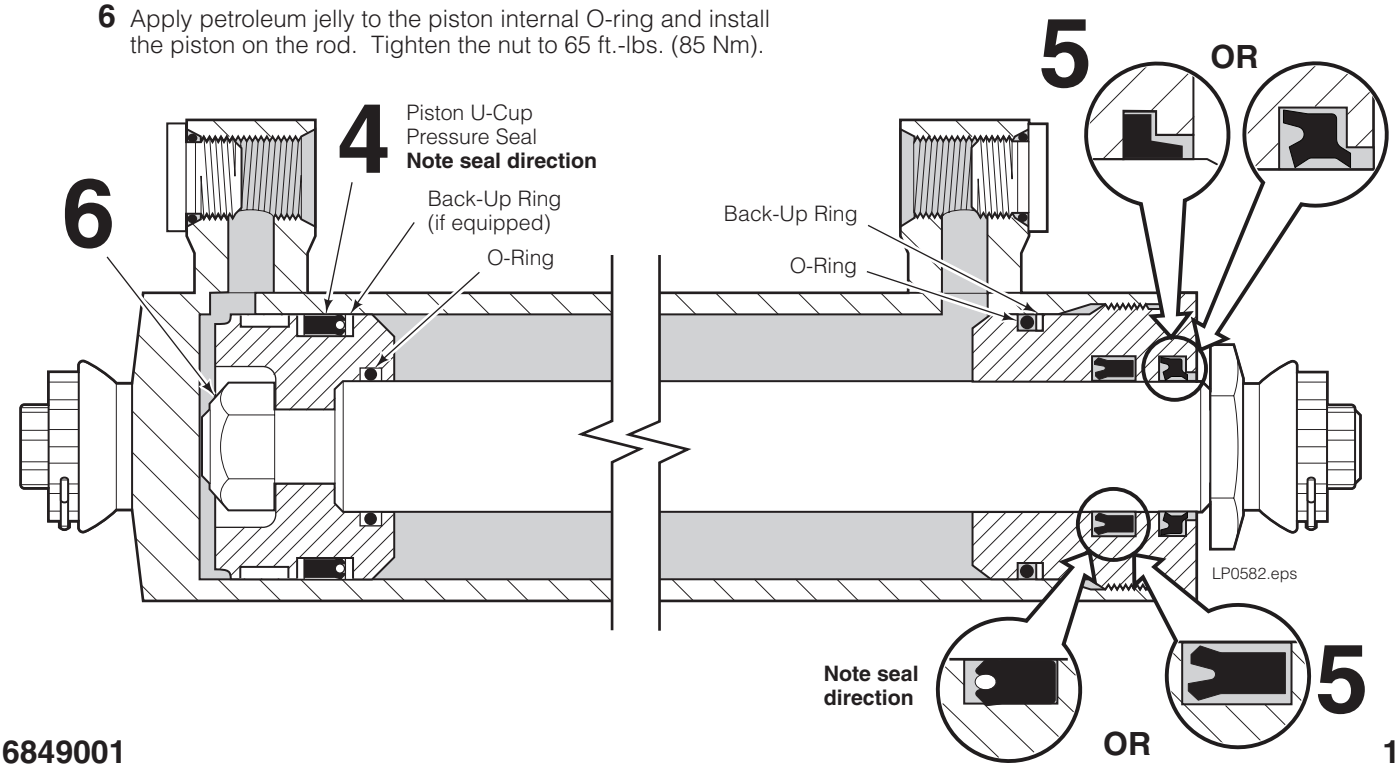
4 Install a new seal and O-ring on the piston. Install the piston seal from the rod end side of the piston by hooking one side into the groove and carefully working the seal over the piston as shown.

5 Install a new rod seal, back-up ring, and wiper seal in the retainer ID, and a new O-ring and back-up ring on the retainer OD as shown.

NOTE: Use internal seal installation tool (Cascade Part No. 599512) to ease seal installation. If installing by hand, form the seal into a 'kidney' shape and position into the internal groove. Use finger pressure to smooth the seal into the groove.

6 Apply petroleum jelly to the piston internal O-ring and install the piston on the rod. Tighten the nut to 65 ft.-lbs. (85 Nm).





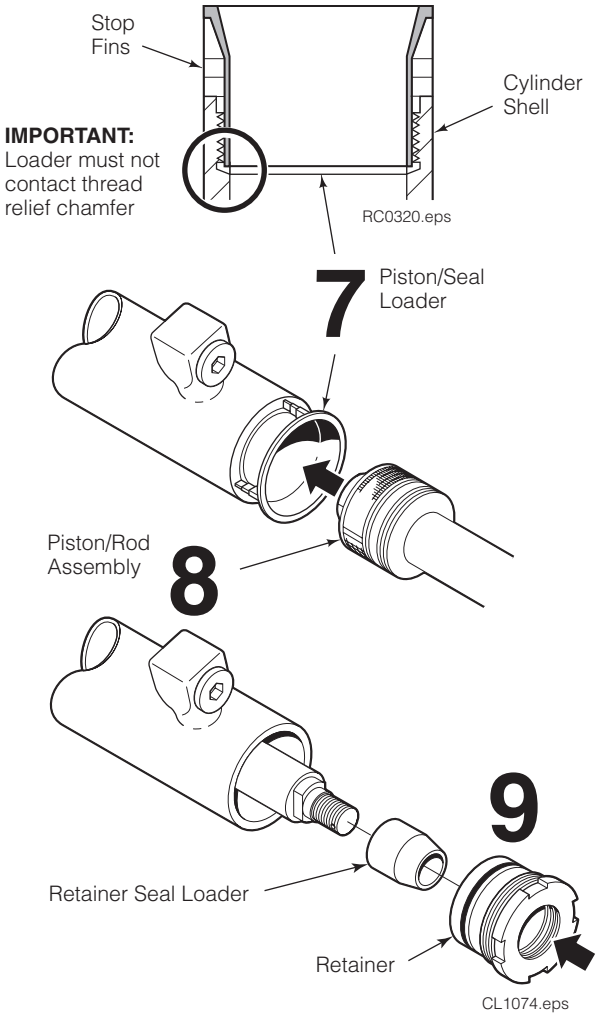
4.3-4 Cylinder Reassembly (Continued)

7 Place the piston loader into the cylinder shell.

IMPORTANT: The loader must cover all of the shell threads but not contact the thread relief chamfer. If necessary, trim the stop fins for a correct fit. The piston will not enter the shell if the loader contacts the thread relief chamfer.

8 Apply a thick film of petroleum jelly to the piston, shell and loader. Using a rubber mallet, tap the piston/rod assembly into the cylinder shell.

9 Place the retainer loader over the rod end threads. Apply petroleum jelly to the retainer ID and slide the retainer onto the rod. Remove the loader and screw the retainer into the shell. Tighten the retainer to 100 ft.-lbs. (135 Nm).



5.1 Specifications

5.1-1 Hydraulics

Truck Relief Settings

2000 psi (138 bar) Recommended
2300 psi (160 bar) Maximum

Truck Flow Volume ①

	Min. ②	Recommended	Max. ③
30A & 30B	5 GPM (18 L/min.)	7 GPM (37 L/min.)	10 GPM (56 L/min.)

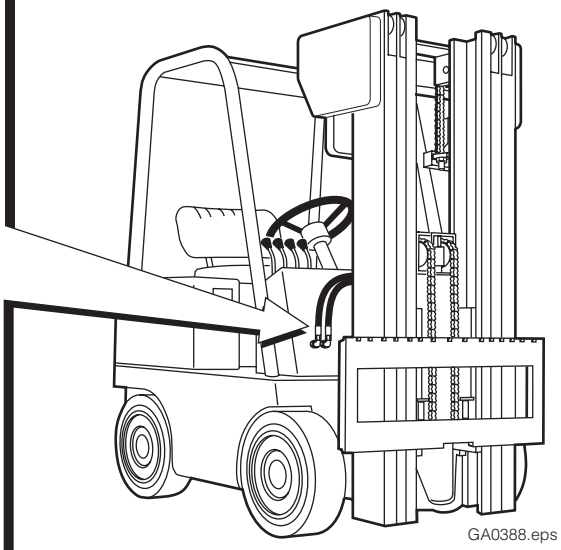
① Cascade attachments are compatible with SAE 10W petroleum base hydraulic fluid meeting Mil. Spec. MIL-0-5606 or MIL-0-2104B. Use of synthetic or aqueous base hydraulic fluid is not recommended. If fire resistant hydraulic fluid is required, special seals must be used. Contact Cascade.

② Flow less than recommended will result in slower than normal operating speed.

③ Flow greater than maximum can result in excessive heating, reduced system performance and short hydraulic system life.

Hoses and Fittings

Hoses and fittings for the CLAMP function should be No. 6 with .250 in. (7 mm) minimum ID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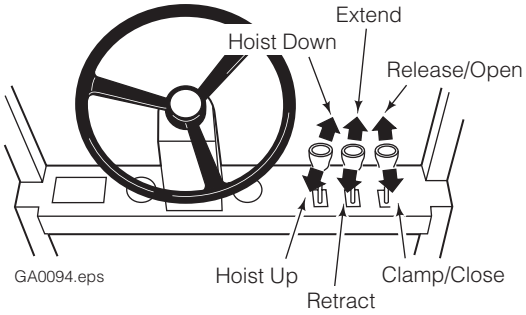
5.1-2 Truck Valve Functions

Check for compliance with ANSI (ISO) standards:



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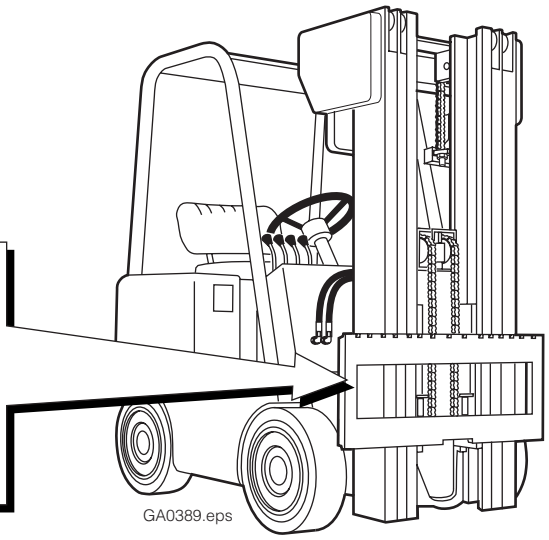
5.1-3 Truck Carriage

Carriage Mount Dimension (A) ITA (ISO)

	Minimum	Maximum
Class II	14.94 in. (380.0 mm)	15.00 in. (381.0 mm)
Class III	18.68 in. (474.5 mm)	18.74 in. (476.0 mm)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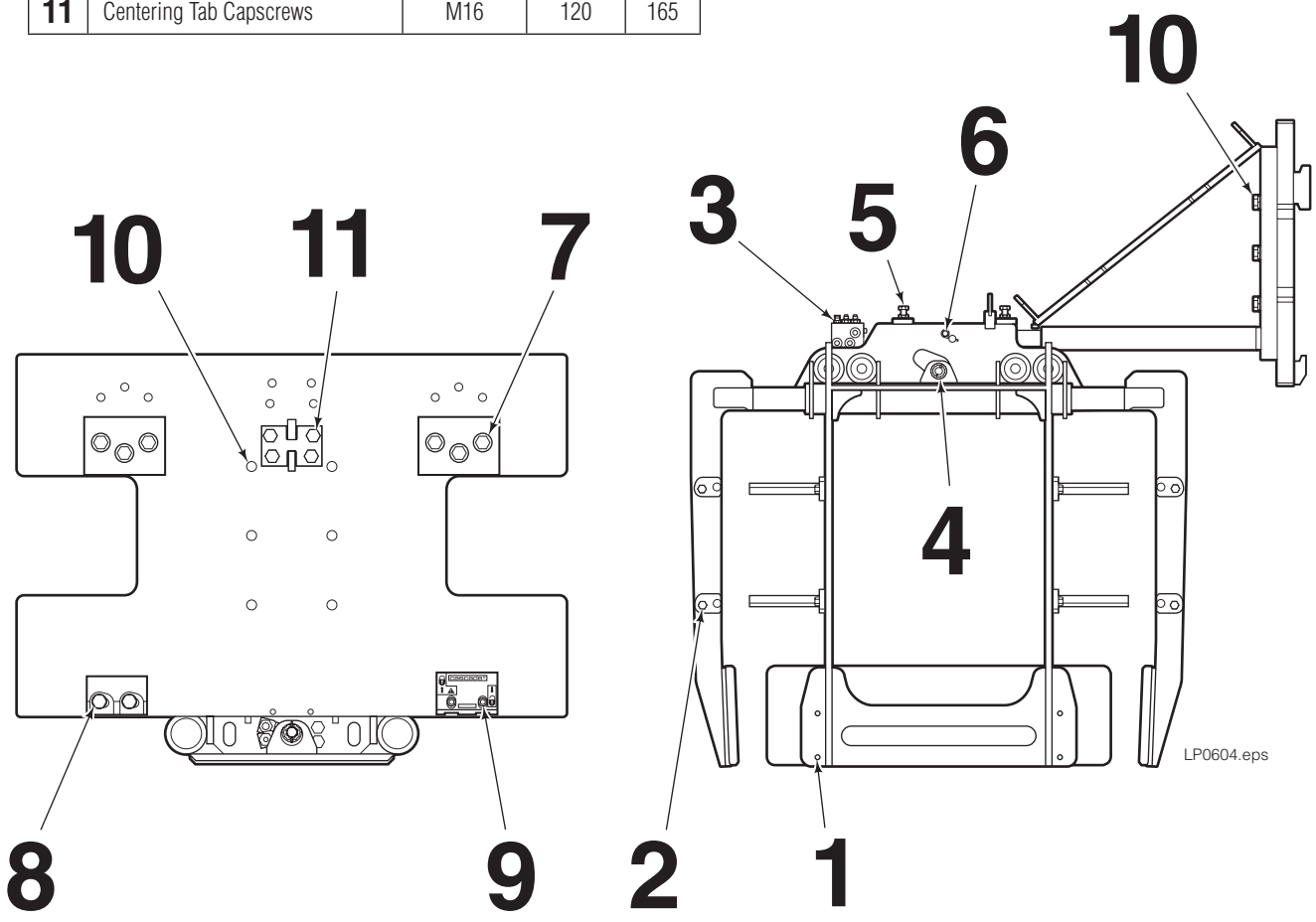
5.1-4 Torque Values – Carriage Mount

Fastener torque values for Carriage Mount Layer Pickers are shown in the table below in both US and Metric units. All torque values are also called out in each specific service procedure section throughout the manual.

NOTE: All fasteners have a torque value range of ±10% of stated value.

Ref.	Fastener Location	Size	Ft.-lbs.	Nm
1	Contact Pad Capscrews	M12	65	90
2	Arm Load Guard Capscrews	M12	65	90
3	Clamp Valve Capscrews	M8	16	25
4	Cylinder Rod Anchor Nut	3/4 UNF	165	225
5	Adjustable Stop Jam Nuts	M12	60	80
6	Pin Retainers	M8	20	30
7	Upper Hook Capscrews	M16	120	165
8	Lower Hook Capscrews	M16	120	165
9	QD Guide Capscrews	M16	120	165
10	Frame Mounting Capscrews	M20	235	320
11	Centering Tab Capscrews	M16	120	165

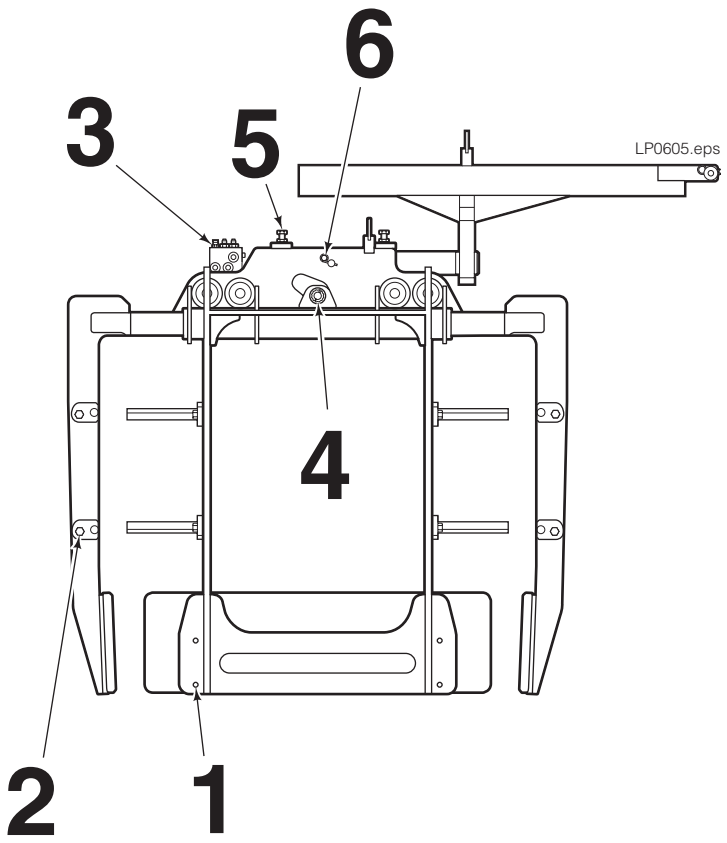


5.1-5 Torque Values – Fork Mount

Fastener torque values for the Fork Mount Layer Picker are shown in the table below in both US and Metric units. All torque values are also called out in each specific service procedure section throughout the manual.

NOTE: All fasteners have a torque value range of ±10% of stated value.

Ref.	Fastener Location	Size	Ft.-lbs.	Nm
1	Contact Pad Capscrews	M12	65	90
2	Arm Load Guard Capscrews	M12	65	90
3	Clamp Valve Capscrews	M8	16	25
4	Cylinder Rod Anchor Nuts	3/4 UNF	165	225
5	Adjustable Stop Jam Nuts	M12	60	80
6	Pin Retainers	M8	20	30



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Visit us online at www.cascorp.com

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